Correlation of Ontario Mathematics 2005 Curriculum to Addison Wesley Math Makes Sense 7

Number Sense and Numeration

Overall Expectations

By the end of Grade 7, students will:

- represent, compare, and order numbers, including integers;
- demonstrate an understanding of addition and subtraction of fractions and integers, and apply a variety of computational strategies to solve problems involving whole numbers and decimal numbers;
- demonstrate an understanding of proportional relationships using percent, ratio, and rate.

Students will:

Specific Expectations	***Addison Wesley Mathematics Makes Sense Grade 7*, lessons:**
Quantity Relationships represent, compare, and order decimals to hundredths and fractions, using a variety of tools (e.g., number lines, Cuisenaire rods, base ten materials, calculators);	Unit 4 Skills You'll Need, 8.1
generate multiples and factors, using a variety of tools and strategies (e.g., identify multiples on a hundreds chart; create rectangles on a geoboard);	1.2
identify and compare integers found in real-life contexts (e.g., -10ºC is much colder than +5ºC);	9.1
represent and order integers using a variety of tools (e.g., two-colour counters, virtual manipulatives, number lines);	9.2, 9.3
select and justify the most appropriate representation of a quantity (i.e., fraction, decimal, percent) for a given context (e.g., "I would use a decimal for recording the length or mass of an object, and a fraction for part of an hour.");	Units 4, 8
represent perfect squares and square roots, using a variety of tools (e.g., geoboards, connecting cubes, grid paper);	1.3
explain the relationship between exponential notation and the measurement of area and volume;	1.4

Specific Expectations	***Addison Wesley Mathematics Makes Sense Grade 7*, lessons:**
Operational Sense divide whole numbers by simple fractions and by decimal numbers to hundredths, using concrete materials (e.g., divide 3 by $\frac{1}{2}$ using fraction strips; divide 4 by 0.8 using base ten materials and estimation);	4.6A (TG lesson)
use a variety of mental strategies to solve problems involving the addition and subtraction of fractions and decimals (e.g., use the commutative property: $3 \times \frac{2}{5} \times \frac{1}{3} = 3 \times \frac{1}{3} \times \frac{2}{5}$, which gives $1 \times \frac{2}{5} = \frac{2}{5}$; use the distributive property: $16.8 \div 0.2$ can be though of as $(16 + 0.8) \div 0.2 = 16 \div 2 + 0.8 \div 0.2$, which gives $80 \div 4 = 84$);	4.1, 4.2, 4.3, 4.4, 4.5 4.7, 4.8, 4.9 with supporting TG notes
solve problems involving the multiplication and division of decimal numbers to thousandths by one-digit whole numbers, using a variety of tools (e.g., concrete materials, drawings, calculators) and strategies (e.g., estimation, algorithms);	4.7 with supporting BLM
solve multi-step problems arising from real-life contexts and involving whole numbers and decimals, using a variety of tools (e.g., concrete materials, drawings, calculators) and strategies (e.g., estimation, algorithms);	1.1, 4.7, 4.8
use estimation when solving problems involving operations with whole numbers, decimals, and percents, to help judge the reasonableness of a solution;	1.1, 4.7, 4.8, 8.2
evaluate expressions that involve whole numbers and decimals, including expressions that contain brackets, using order of operations;	4.9, Skills You'll Need Unit 10
add and subtract fractions with simple like and unlike denominators, using a variety of tools (e.g., fraction circles, Cuisenaire rods, drawings, calculators) and algorithms;	4.2, 4.3, 4.4, 4.5
demonstrate, using concrete materials, the relationship between the repeated addition of fractions and the multiplication of that fraction by a whole number (e.g., $\frac{1}{2} + \frac{1}{2} + \frac{1}{2} = 3 \times \frac{1}{2}$);	4.6

Specific Expectations	***Addison Wesley Mathematics Makes Sense Grade 7*, lessons:**
add and subtract integers, using a variety of tools (e.g., two-colour counters, virtual manipulatives, number lines);	9.4, 9.5, 9.6, 9.7
Proportional Relationships determine, through investigation, the relationships among fractions, decimals, percents, and ratios;	8.1
solve problems that involve determining whole number percents, using a variety of tools (e.g., base ten materials, paper and pencil, calculators);	8.1, 8.2, 8.3, 8.5
demonstrate an understanding of rate as a comparison, or ratio, of two measurements with different units (e.g., speed is a rate that compares distance to time and that can be expressed as kilometres per hour);	2.5
solve problems involving the calculation of unit rates;	2.3, 2.4

Measurement

Overall Expectations

By the end of Grade 7, students will:

- report on research into real-life applications of area measurements;
- determine the relationships among units and measurable attributes, including the area of a trapezoid and volume of a right prism.

Students will:

Specific Expectations	***Addison Wesley Mathematics Makes Sense Grade 7*, lessons:**
Attributes, Units, and Measurement Sense research and report on real-life applications of area measurements (e.g., building a skateboard; painting a room);	Unit 6 Problem
Measurement Relationships sketch different polygonal prisms that share the same volume;	3.6, 6.4A (TG lesson)
solve problems that require conversion between metric units of measure (e.g., millimetres and centimetres, grams and kilograms, millilitres and litres);	Unit 2 Skills You'll Need, 2.4
solve problems that require conversion between metric units of area (i.e., square centimetres, square metres);	6.4B (TG lesson)
determine, through investigation using a variety of tools (e.g., concrete materials, dynamic geometry software) and strategies, the relationship for calculating the area of a trapezoid, and generalize to develop the formula [i.e., *Area* = (*sum of lengths of parallel sides* × *height)* ÷2];	6.3 with supporting TG note
solve problems involving the estimation and calculation of the area of a trapezoid;	6.3
estimate and calculate the area of composite two-dimensional shapes by decomposing into shapes with known area relationships (e.g., rectangle, parallelogram, triangle);	6.1, 6.4

Specific Expectations	***Addison Wesley Mathematics Makes Sense Grade 7*, lessons:**
determine, through investigation using a variety of tools and strategies (e.g., decomposing right prisms; stacking congruent layers of concrete materials to form a right prism), the relationship between the height, the area of the base, and the volume of right prisms with simple polygonal bases (e.g., parallelograms, trapezoids), and generalize to develop the formula (i.e., Volume = area of base x height);	6.4A (TG lesson)
determine, through investigation using a variety of tools (e.g., nets, concrete materials, dynamic geometry software, Polydrons), the surface area of right prisms;	6.4B (TG lesson)
solve problems that involve the surface area and volume of right prisms and that require conversion between metric measures of capacity and volume (i.e., millilitres and cubic centimetres).	3.5, 3.6, 6.4A (TG lesson), 6.4B (TG lesson)

Geometry and Spatial Sense

Overall Expectations

By the end of Grade 7, students will:

- construct related lines, and classify triangles, quadrilaterals and prisms;
- develop an understanding of similarity, and distinguish similarity and congruence;
- describe location in the four quadrants of a coordinate system, dilatate two-dimensional shapes, and apply transformations to create and analyse designs.

Students will:

Specific Expectations	***Addison Wesley Mathematics Makes Sense Grade 7*, pages:**
Geometric Properties construct related lines (i.e., parallel; perpendicular; intersecting at 30º, 45º, and 60º), using angle properties and a variety of tools (e.g., compass and straight edge, protractor, dynamic geometry software) and strategies (e.g., paper folding);	7.1A (TG Technology feature)
sort and classify triangles and quadrilaterals by geometric properties related to symmetry , angles, and sides, through investigation using a variety of tools (e.g., geoboard, dynamic geometry software) and strategies (e.g., using charts, using Venn diagrams),	Unit 3 Skills You'll Need, 7.1, 7.6A (TG lesson)
construct angle bisectors and perpendicular bisectors, using a variety of tools (e.g., Mira, dynamic geometry software, compass) and strategies (e.g., paper folding), and represent equal angles and equal lengths using mathematical notation;	7.1B (TG Technology feature)
investigate, using concrete materials, the angles between the faces of a prism, and identify right prisms;	3.5 with supporting TG note, 6.4A (TG lesson)
Geometric Relationships identify, through investigation, the minimum side and angle information (i.e., side-side-side; side-angle-side; angle-side-angle) needed to describe a unique triangle (e.g., "I can draw many triangles if I'm only told the length of one side, but there's only one triangle I can draw if you tell me the lengths of all three sides.");	7.2

Specific Expectations	***Addison Wesley Mathematics Makes Sense Grade 7*, lessons:**
determine, through investigation using a variety of tools (e.g., dynamic geometry software, concrete materials, geoboard), relationships among area, perimeter, corresponding side lengths, and corresponding angles of congruent shapes;	7.2 with supporting TG note
demonstrate an understanding that enlarging or reducing two-dimensional shapes creates similar shapes;	Cross Strand Investigation, page 112, 7.3A (TG lesson)
distinguish between and compare similar shapes and congruent shapes, using a variety of tools (e.g., pattern blocks, grid paper, dynamic geometry software) and strategies (e.g., by showing that dilatations create similar shapes and that translations, rotations, and reflections generate congruent shapes;	7.2, 7.3A (TG lesson)
Location and Movement plot points using all four quadrants of the Cartesian coordinate plane;	9.7A (TG lesson)
identify, perform, and describe dilatations (i.e., enlargements and reductions), through investigation using a variety of tools, (i.e., dynamic geometry software, geoboard, pattern blocks, grid paper);	7.3B (TG Technology feature)
create and analyse designs involving translations, reflections, dilatations, and/or simple rotations of two-dimensional shapes, using a variety of tools (e.g., concrete materials, Mira, drawings, dynamic geometry software) and strategies (e.g., paper folding);	Unit 7 Problem, 7.3, 7.4, 7.5, Technology feature, page 274
determine, through investigation using a variety of tools (e.g., pattern blocks, Polydrons, grid paper, tiling software, dynamic geometry software, concrete materials), polygons or combinations of polygons that tile a plane, and describe the transformation(s) involved;	7.4

Patterning and Algebra

Overall Expectations

By the end of Grade 7, students will:

- represent linear growing patterns (where the terms are whole numbers) using concrete materials, graphs, and algebraic expressions;
- model real-life linear relationships graphically and algebraically, and solve simple algebraic equations using a variety of strategies, including inspection and guess and check.

Students will:

Specific Expectations	***Addison Wesley Mathematics Makes Sense Grade 7*, lessons:**
Patterns and Relationships represent linear growing patterns, using a variety of tools (e.g., concrete materials, paper and pencil, calculators, spreadsheets) and strategies (e.g., make a table of values using the term number and the term; plot the coordinates on a graph; write a pattern rule using words);	1.5, Unit 1 Problem, 10.1, 10.2
make predictions about linear growing patterns, through investigation with concrete material;	1.5, 10.1, 10.2
develop and represent the general term of a linear growing pattern, using algebraic expressions involving one operation (e.g., the general term for the sequence 4, 5, 6, 7, … can be written algebraically as $n + 3$, where n represents the term number; the general term for the sequence 5, 10, 15, 20, … can be written algebraically as $5n$, where n represents the term number);	10.1 with supporting TG note
compare pattern rules that generate a pattern by adding or subtracting a constant, or multiplying or dividing by a constant, to get the next term (e.g., for 1, 3, 5, 7, 9, …, the pattern rule is "start at 1 and add 2 to each term to get the next term") with pattern rules that use the term number to describe the general term (e.g., for 1, 3, 5, 7, 9, …, the pattern rule is "double the term number and subtract 1", which can be written algebraically as $2 \times n - 1$);	10.1
Variables, Expressions, and Equations model real-life relationships involving constant rates where the initial condition starts at 0 (e.g., speed, heart rate, billing rate), through investigation using tables of values and graphs);	2.5, 10.2

Specific Expectations	***Addison Wesley Mathematics Makes Sense Grade 7*, lessons:**
model real-life relationships involving constant rates (e.g., speed, heart rate, billing rate), using algebraic equations with variables to represent the changing quantities in the relationship (e.g., the equation $p = 4t$ represents the relationship between the total number of people that can be seated (p) and the number of tables (t), given that each table can seat 4 people [4 people per table is the constant rate]);	10.3
translate phrases describing simple mathematical relationships into algebraic expressions (e.g., one more than three times a number can be written algebraically as $1 + 3x$ or $3x + 1$), using concrete materials (e.g., algebra tiles, pattern blocks, counters);	10.3
evaluate algebraic expressions by substituting natural numbers for the variables;	10.4
make connections between evaluating algebraic expressions and determining the term in a pattern using the general term (e.g., for 3, 5, 7, 9, …, the general term is the algebraic expression $2n + 1$; evaluating this expression when $n = 12$ tells you that the 12^{th} term is $2(12) + 1$, which equals 25);	10.3, 10.4 with supporting TG notes
solve linear equations of the form $ax = c$ or $c = ax$ and $ax + b = c$ or variations such as $b + ax = c$ and $c = bx + a$ (where a, b, and c are natural numbers) by modelling with concrete materials, by inspection, or by guess and check, with and without the aid of a calculator (e.g., "I solved $x + 7 = 15$ by using guess and check. First I tried 6 for x. Since I knew that 6 plus 7 equals 13 and 13, is less than 15, then I knew that x must be greater than 6.").	10.5, 10.6

Data Management and Probability

Overall Expectations

By the end of Grade 7, students will:

- collect and organize categorical, discrete, or continuous primary data and secondary data and display the data using charts and graphs, including relative frequency tables and circle graphs ;
- make and evaluate convincing arguments, based on the analysis of data;
- compare experimental probabilities with the theoretical probability of an outcome involving two independent events.

Students will:

Specific Expectations	***Addison Wesley Mathematics Makes Sense Grade 7*, lessons:**
Collection and Organization of Data collect data by conducting a survey or an experiment to do with themselves, their environment, issues in their school or community, or content from another subject and record observations or measurements;	5.1, 5.2, 5.3, Cross Strand Investigations, pages 286 and 432
collect and organize categorical, discrete, or continuous primary data and secondary data (e.g., electronic data from websites such as E-Star or Census At Schools) and display the data in charts, tables, and graphs (including relative frequency tables and circle graphs), that have appropriate titles, labels (e.g., appropriate units marked on the axes), and scales (e.g., with appropriate increments) that suit the range and distribution of the data, using a variety of tools (e.g., graph paper, spreadsheets, dynamic statistical software);	5.1, 5.2, 5.3, Technology features in Unit 5, Cross Strand Investigations, pages 286 and 432, 8.4
select an appropriate type of graph to represent a set of data, graph the data using technology, and justify the choice of graph (i.e., from types of graphs already studied);	Unit 5 Technology Feature, page 193
distinguish between a census and a sample from a population;	5.1 with supporting TG note
identify bias in a data collection methods;	5.1

Specific Expectations	***Addison Wesley Mathematics Makes Sense Grade 7*, lessons:**
Data Relationships read, interpret, and draw conclusions from primary data (e.g., survey results, measurements, observations) and from secondary data (e.g., temperature data or community data in the newspaper, data from the Internet about populations) presented in charts, tables, and graphs (including relative frequency tables and circle graphs);	5.1, 5.2, 5.3, 5.5, Unit 5 Technology Features, pages 172, 185, and 193, Cross Strand Investigations, pages 286 and 432, 8.4
identify, through investigation, graphs that present data in misleading ways (e.g., line graphs that exaggerate change by starting the vertical axis at a point greater than zero);	5.6
determine, through investigation, the effect on a measure of central tendency (i.e., mean, median, and mode) of adding or removing a value or values (e.g., changing the value of an outlier may have a significant effect on the mean but no effect on the median)	5.5 with supporting BLM
identify and describe trends, based on the distribution of the data presented in tables and graphs, using informal language;	5.4
make inferences and convincing arguments that are based on the analysis of charts, tables, and graphs;	5.2, 5.3, Unit 5 Technology Feature, page 185, 5.4
Probability research and report real-world applications of probabilities expressed in fraction, decimal, and percent form (e.g., lotteries, batting averages, weather forecasts, elections);	11.2, 11.3, 11.4
make predictions about a population when given a probability;	11.3 with supporting TG note
represent in a variety of ways (e.g., tree diagrams, tables, models, systematic lists) all the possible outcomes of a probability experiment involving two independent events (i.e., one event does not affect the other event), and determine the theoretical probability of a specific outcome involving two independent events);	11.1
perform a simple probability experiment involving two independent events, and compare the experimental probability with the theoretical probability of a specific outcome.	11.3 with supporting TG note